Appendix F

Regulatory Information

Appendix F

Inorganic Contaminants

Regulation	Maximum Contaminant Level (MCL) (mg/L unless otherwise noted)	Potential Health Effects of Contaminant
Antimony	0.006	Increase in blood cholesterol, Decrease in blood glucose
Arsenic[4]	0.05 (Interim Standard)	Skin Damage, Circulatory System Toxicity Effects, Cancer Risk
Asbestos[1]	7 MFL	Lung Cancer Risk, Risk of Intestinal Polyes
Barium	2.0	Increase in Blood Pressure
Beryllium	0.004	Intestinal Lesions
Cadmium	0.005	Kidney Damage
Chromium (total)	0.10	Allergic Dermatitis
Copper*	Treatment Technique (Action Level = 1.3 mg/L)	Gastrointestinal Effects, Liver or Kidney damage
Cyanide	0.20	Nerve Damage or Thyroid Problems
Fluoride	4.0	Skeletal & Dental Effects
Lead*	Treatment Technique (Action Level = 0.015 mg/L)	Kidney Problems, High Blood Pressure High Toxicity to infants, Delays in Physical & Mental Development
Mercury (inorganic)	0.002	Kidney Damage
Nitrate (as N)[2]	10.0	Methemoglobulinemia (Blue Baby Syndrome)
Nitrite (as N)[3]	1.0	Methemoglobulinemia (Blue Baby Syndrome)
Selenium	0.05	Hair or Fingernail Loss, Circulatory Problems, Numbness
Thallium	0.002	Kidney, Liver, & Intestine Problems, Hair Loss, Blood Change

Monitoring Requirements:

Inorganic Contaminants (IOCs) - One sample per year for surface water and one sample every 3 years for groundwater for IOCs not including Asbestos, Lead and Copper, Nitrate, Nitrite, and Radionuclides.

Asbestos - Once every 9 years MFL (Million Fibers per Liter less than 10 Microns).

Nitrate - Ground water annually; Surface water quarterly.

Nitrite - One sample every 3 years.

Lead and Copper - The USEPA has made minor changes to the Lead and Copper Rule. The minor revisions streamline the requirements, promote consistent national implementation, and reduce burdens placed on many systems. The revisions did not change the action level of 0.015 mg/L for Lead and 1.3 mg/L for Copper. The revisions fall into seven broad categories which include demonstration of optimal corrosion control, lead service line replacement requirements, public education requirements, monitoring requirements, analytical methods, reporting and record keeping requirements, and special primacy considerations. (More detailed information on these revisions is available at www.epa.gov)

Organic Contaminants

Regulation	Maximum Contaminant Level (MCL) (mg/L unless otherwise noted)	Potential Health Effects of Contaminant
Volatile Organic Compounds		
1,1,1-Trichloroethane	0.2	Nervous System, Liver, or Circulatory Problems
1,1,2- Trichloroethane	0.005	Liver, Kidney, or Immune System Problems
1,1-Dichloroethylene	0.007	Liver Problems
1,2,4-Trichlorobenzene	0.07	Changes in Adrenal Glands
1,2-Dichloroethane	0.005	Cancer Risk
1,2-Dichloropropane	0.005	Cancer Risk
1,2-Dibromo-3-Chloropropane (DBCP)	0.0002	Cancer Risk, Reproductive Difficulties
Benzene	0.005	Cancer Risk, Anemia, Decrease in Blood Platelets
Carbon Tetrachloride	0.005	Cancer Risk, Liver Problems
Chlorobenzene	0.1	Liver or Kidney Problems
Cis-1,2-Dichloroethylene	0.07	Liver Problems
Dichloromethane	0.005	Cancer Risk, Liver Problems
Ethylbenzene	0.7	Liver and Kidney Problems
O-Dichlorobenzene	0.6	Liver, Kidney, and Circulatory System Problems
P-Dichlorobenzene	0.075	Anemia, Changes in Blood, Liver, Kidney and/or Spleen Damage
Styrene	0.1	Liver, Kidney, and Circulatory Problems
Tetrachloroethylene (PCE)	0.005	Cancer Risk, Liver Problems
Toluene	1.0	Liver, Kidney, or Nervous System Problems
Trans-1, 2-Dichloroethylene	0.1	Liver Problems
Trichloroethylene (TCE)	0.005	Cancer Risk, Liver Problems
Vinyl Chloride	0.002	Cancer Risk
Xylenes (total)	10.0	Nervous System Damage
Synthetic Organic Compounds		
2,3,7,8-TCDD (Dioxin)	0.00000003	Cancer Risk, Reproductive Difficulties
2,4,5-TP (Silvex)	0.05	Liver Problems
2,4-D	0.07	Liver, Kidney or Adrenal Gland Problems
Acrylamide	Treatment Technique Required	Cancer Risk, Nervous System Effects, Blood Problems
Alachlor	0.002	Cancer Risk, Eye, Liver, Kidney, or Spleen Problems
Aldicarb	0.003*	Nervous System Effects
Aldicarb Sulfone	0.003*	Nervous System Effects
Aldicarb Sulfoxide	0.004*	Nervous System Effects
Atrazine	0.003	Cardiovascular System Problems, Reproductive Difficulties
Carbofuran	0.04	Nervous System Problems, Reproductive Difficulties, Blood Problems
Chlordane	0.002	Cancer Risk, Liver Problems Nervous System Problems
Dalapon	0.2	Minor Kidney Changes
Di(2-ethylhexyl)adipate	0.4	Reproductive Difficulties, General Toxic Effects
Dibromochloropropane (DBCP)	0.0002	Cancer Risk
Di(2-ethylhexyl)phthalate	0.006	Cancer Risk, Reproductive Difficulties, Liver Problems
Dinoseb	0.007	Reproductive Difficulties
Diquat	0.02	Cataracts
Endothall	0.1	Stomach and Intestinal Problems
Endrin	0.002	Nervous System Effects
Epichlorohydrin	Treatment Technique Required	Cancer Risk, Stomach Problems, Reproductive Difficulties
Ethylene Dibromide (EDB)	0.00005	Cancer Risk, Stomach Problems, Reproductive Difficulties
Glyphosate	0.7	Kidney Problems, Reproductive Difficulties
Heptachlor	0.0004	Cancer Risk, Liver Damage
Heptachlor Epoxide	0.0002	Cancer Risk, Liver Damage
Hexachlorobenzene	0.001	Cancer Risk, Liver or Kidney Problems, Reproductive Difficulties
Hexachlorocyclopentadiene (HEX)	0.05	Kidney & Stomach Effects
Lindane	0.0002	Liver, or Kidney Problems
Methoxychlor	0.04	Reproductive Difficulties
Oxamyl (Vydate)	0.2	Nervous System Effects
PAHs (Benzo(a)pyrene)	0.0002	Cancer Risk, Reproductive Difficulties
PCBs (Polychlorinated Biphenyls)	0.0005	Cancer Risk, Skin Changes, Thymus Gland Problems, Immune Deficiencies, Reproductive or Nervous System Difficulties
Pentachlorophenol	0.001	Cancer Risk, Liver or Kidney Problems
Picloram	0.5	Liver Problems
Simazine	0.004	Blood Problems
Toxaphene	0.003	Cancer Risk, Kidney, Liver, or Thyroid Problems

* Final MCLs for aldicarb and metabolites and a regulatory schedule are to be developed in the future by the USEPA. The dates to publish a proposal schedule have not been published as of this publication.

Monitoring Requirements:

VOCs - Original monitoring required 4 quarterly samples during the first 3 years. If no detections, annual monitoring should have begun in 1996. If all 21 VOCs were sampled after January 1988 and not detected, the state may have authorized annual sampling in 1993. Monitor every 3 years. After 3 years of no detections, monitoring may be reduced based upon results of vulnerability assessment.

SOCs - Original monitoring required 4 quarterly samples every 3 years. After one round of no detections, systems > 3,300 reduce to 2 samples per year every 3 years, systems < 3,300 reduce to one sample every 3 years. Monitoring may be reduced or eliminated based upon results of vulnerability assessment.

Microbiological Contaminants

Regulation	Maximum Contaminant Level (MCL) (mg/L unless otherwise noted)	Potential Health Effects of Contaminant
Total Coliform Rule[1] Total Coliforms Fecal Coliforms E. Coli	Less than 40 samples per month no more than 1 can be positive. If 40 samples or more per month, no more than 5% can be positive. Maximum Contaminant Level Goal (MCLG) is zero for total coliform, fecal coliform, and E. Coli. Every Sample containing total coliforms must be analyzed for fecal coliforms.	The presence of these bacteria indicate gastroenteric pathogens.
Surface Water Treatment Rule[2]		
Turbidity	Treatment Technique Required	None, interferes with disinfection effectiveness
Giardia	Treatment Technique Required (MCLG=0)	Giardiasis
Enteric Viruses	Treatment Technique Required (MCLG=0)	Gastrointestinal & other viral infections
Legionella	Treatment Technique Required (MCLG=0)	Legionnaire's Disease
Heterotrophic Plate Count (HPC)	Treatment Technique Required (MCLG=none)	Gastrointestinal infections. Indicates water quality & treatment effectiveness
Interim Enhanced Surface Water Treatment Rule[3]		
Turbidity	Treatment Technique Required (Performance Standards)	None, interferes with disinfection effectiveness
Cryptosporidium	Treatment Technique Required (MCLG=0)	Cryptosporidiosis

1 The Total Coliform Rule (published June 1989/effective December 1990) set both health goals (MCLGs) and legal limits (MCLs) for total coliform levels in drinking water. The rule also details the type and frequency of testing that water systems must do. If a sample tests positive for coliforms, the system must collect a set of repeat samples within 24 hours. When a routine or repeat sample tests positive for total coliforms, it must also be analyzed for fecal coliforms and Escherichia coli (E. coli). The number of coliform samples a system must take depends on the number of customers that it serves. Systems which serve fewer than 1,000 people may test once a month or less frequently, while systems with 50,000 customers test 60 times per month and those with 2.5 million customers test at least 420 times per month. These are minimum schedules, and many systems test more frequently.

2. The Surface Water Treatment Rule (SWTR) (published June 1989/effective December 1990) seeks to prevent waterborne diseases caused by Viruses, Legionella, and Giardia lamblia. These disease-causing microbes are present at varying concentrations in most surface waters. The rule requires that water systems filter and disinfect water from surface water sources to reduce the occurrence of unsafe levels of these microbes. Turbidity monitoring must consist of continuous sampling or grab samples every four (4) hours. Treatment effectiveness is demonstrated by 80% turbidity reduction or producing less than 0.5 NTU in finished water, depending on raw turbidity level.

3. The Interim Enhanced Surface Water Treatment Rule (IESWTR) applies to systems using surface water or groundwater under the direct influence of surface water that serve 10,000 or more persons. The rule also includes provisions for states to conduct sanitary surveys for surface water systems regardless of system size. The rule builds upon the requirements of the SWTR with the following key modifications:

- Maximum contaminant level goal (MCLG) of zero for Cryptosporidium
- 2-log Cryptosporidium removal requirements for systems that filter
- Strengthened combined filter effluent turbidity performance standards
- Individual filter turbidity monitoring provisions
- Disinfection profiling and benchmarking provisions
- Systems using groundwater under direct influence of surface water are now subject to the new rules
- Inclusion of Cryptosporidium in watershed control requirements for unfiltered public water systems
- Requirements for covers on new finished water reservoirs
- Sanitary surveys, conducted by states, for all surface water systems regardless of size

OTHER RULES

ITEM #1

Consumer Confidence Reports

Public Water Systems (PWSs) are to prepare and distribute annual CCRs to their customers. The CCR must include information on the source water quality of the customer's drinking water. The report must include Maximum Contaminant Level Goal (MCLG) information, MCL information, and health effect information of contaminants detected in the drinking water. The CCR Rule was promulgated on August 19, 1998. The first CCR was to be delivered to the PWSs customers by October 19, 1999; the following one by July 2000, and annually thereafter.

ITEM #2

Filter Backwash Recycling Rule

The Filter Backwash Recycling Rule (FBRR) requires PWSs to review their backwash water recycling practices to ensure that they do not compromise microbial control. Under the FBRR, recycled filter backwash water, sludge thickener supernatant, and liquids from dewatering processes must be returned to a location such that all processes of a system's conventional or direct filtration facility, including coagulation, flocculation, sedimentation (conventional filtration only) and filtration, are employed. Systems may apply to the State for approval to recycle at an alternate location. The FBRR applies to all public water systems, regardless of size. The FBRR was promulgated in June 2001. For compliance schedules visit www.epa.gov.

ITEM #3

LT1ESWTR

While the Stage 1 D/DBP Rule applies to systems of all sizes, the IESWTR only applies to systems serving 10,000 or more people. The Long Term 1 Enhanced Surface Water Treatment Rule will strengthen microbial controls for small systems serving fewer than 10,000 people. The rule will also prevent significant increases in microbial risk where small systems take steps to implement the Stage 1 D/DBP Rule. The USEPA believes that the rule will generally follow the approaches initiated in the IESWTR for improved turbidity control, including individual filter monitoring and reporting. The rule will also address disinfection profiling and benchmarking. For additional information please visit www.epa.gov.

ITEM #4

GROUND WATER RULE

USEPA has proposed a Ground Water Rule (GWR) that specifies the appropriate use of disinfection while addressing other components of groundwater systems to ensure public health protection. There are more than 158,000 public groundwater systems. Almost 89 million people are served by community groundwater systems, and 20 million people are served by non-community groundwater systems. For additional information visit www.epa.gov.

The proposed requirements of the GWR include:

- ❖ System sanitary surveys conducted by the State and identification of significant deficiencies;
- ❖ Sensitivity assessments for undisinfected systems;
- ❖ Source water microbial monitoring by systems that do not disinfect and draw from hydrogeologically sensitive aquifers or have detected fecal indicators within the system's distribution system;
- ❖ Corrective action by any system with significant deficiencies or positive microbial samples indicating fecal contamination; and
- ❖ Compliance monitoring for systems that disinfect to ensure that they reliably achieve 4-log (99.99 percent) inactivation or removal of viruses.

ITEM #5

LT2ESWTR AND STAGE 1 2 D/DBP RULE

The SDWA, as amended in 1996, requires USEPA to finalize a Stage 2 D/DBP Rule by May 2002. Although the 1996 Amendments do not require USEPA to finalize a Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR) along with the Stage 2 D/DBP Rule, USEPA believes it is important to finalize these rules together to ensure a proper balance between microbial and DBP risks. USEPA began discussions with stakeholders in December 1998 on the direction for these rules. USEPA anticipates proposing these rules in 2002. The intent of these rules is to provide additional public health protection, if needed, from DBPs and microbial pathogens. The requirements of the LT2ESWTR will apply to all public water systems that use surface water or ground water under the direct influence of surface water.

LT2ESWTR

The FACA recognizes that systems may need to provide additional protection against Cryptosporidium, and that such decisions should be made on a system specific basis. The LT2ESWTR incorporates system specific treatment requirements based on a 'Microbial Framework' approach. This approach generally involves assignment of systems into different categories (or bins) based on the results of source water Cryptosporidium monitoring. Additional treatment requirements depend on the bin to which the system is assigned. Systems will choose technologies to comply with additional treatment requirements from a 'toolbox' of options. Visit www.epa.gov to review the regulations.

Stage 2 D/DBP

The requirements in the Stage 2 D/DBP Rule will apply to all community water systems and non-community water systems that add a disinfectant other than UV or deliver water that has been disinfected. The Stage 2 D/DBP is designed to reduce DBP occurrence peaks in the distribution system based on changes to compliance monitoring provisions. Compliance monitoring will be preceded by an initial distribution system monitoring (IDSE) study to select site-specific optimal sample points for capturing peaks. Compliance with each MCL will be determined based on a Locational Running Annual Average (a running annual average must be calculated at each sample location). Systems will comply with the Stage 2 D/DBP Rule MCL in two phases:

Phase 1: 3 years after rule promulgation (with an additional 2-year extension available for systems requiring capital improvements), all systems must comply with a 120/100 locational running annual average (LRAA) based on Stage 1 monitoring sites and also continue to comply with Stage 1 80/60 running annual average (RAA).

Phase 2: 6 years after rule promulgation (with an additional 2-year extension available for systems requiring capital improvements) large and medium systems must comply with an 80/60 LRAA based on new sampling sites identified under the IDSE. For small systems required to do Cryptosporidium monitoring, compliance with the 80/60 LRAA will begin 8.5 years after rule promulgation (with an additional 2-year extension available for systems requiring capital improvements).